

In the Claims:

Please cancel claims 1 and 17 without prejudice.

Please amend claims 2-7, 14-16, and 18-20 as follows:

1. (canceled)

2. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 1 wherein for a partial-response maximum-likelihood (PRML) data channel in a direct access storage device (DASD) comprising:

a Viterbi detector for receiving equalized PR4 samples including a predefined word synchronization pattern; said Viterbi detector being optimized for said predefined word synchronization pattern; said Viterbi detector including

a two-state Viterbi trellis;

a word synchronization detector for said two-state Viterbi trellis; and

said two-state Viterbi trellis and said word synchronization detector are operated on a 2T basis, where $1/T$ is the sample rate.

3. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 4-2 wherein said predefined word synchronization pattern includes multiple pattern match sequences.

4. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 4-2 wherein said predefined word synchronization pattern includes three pattern match sequences.

5. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 4-2 wherein said predefined word synchronization pattern includes a repetition code including pairs of zeros and pairs of ones.

6. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance ~~as recited in claim 1~~ wherein for a partial-response maximum-likelihood (PRML) data channel in a direct access storage device (DASD) comprising:

a Viterbi detector for receiving equalized PR4 samples including a predefined word synchronization pattern; said predefined word synchronization pattern includes only even length magnets; said Viterbi detector being optimized for said predefined word synchronization pattern; said Viterbi detector including

a two-state Viterbi trellis; and

a word synchronization detector for said two-state Viterbi trellis.

7. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 4-2 wherein said word synchronization detector implements a difference metric for said two-state Viterbi trellis and includes a three-way multiplexer.

8. (original) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 7 wherein said three-way multiplexer includes an input of added incoming samples, said added incoming samples represented by $(Y_{K-2} + Y_{K-3})$.

9. (original) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 8 wherein said three-way multiplexer includes an input of added and shifted incoming samples, said added and shifted incoming samples represented by $(Y_{K-2} + Y_{K-3}) + 4$.

10. (original) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 9 wherein said three-way multiplexer includes an input of a difference metric, said difference metric represented by DS_{K-4} .

11. (original) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 10 wherein said three-way multiplexer includes select inputs for selecting said added incoming samples $(Y_{K-2} + Y_{K-3})$ responsive to said added incoming samples $(Y_{K-2} + Y_{K-3})$ being greater than or equal to said difference metric DS_{K-4} .

12. (original) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 10 wherein said three-way multiplexer includes select inputs for selecting said added and shifted incoming samples represented by $(Y_{K-2} + Y_{K-3}) + 4$ responsive to a shifted difference metric $DS_{K-4} - 4$ being greater than or equal to said added incoming samples $(Y_{K-2} + Y_{K-3})$.

13. (original) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 10 wherein said three-way multiplexer includes select inputs for selecting said difference metric DS_{K-4} responsive to a shifted difference metric $DS_{K-4} - 4$ being less than said added incoming samples $(Y_{K-2} + Y_{K-3})$ and said added incoming samples $(Y_{K-2} + Y_{K-3})$ being less than said difference metric DS_{K-4} .

14. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 4- 2 wherein said word synchronization detector implements a difference metric for said two-state Viterbi trellis and includes a path memory providing detected output decisions a_{K-13}, a_{K-12} .

15. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 14 wherein said detected output decisions a_{K-13}, a_{K-12} of said path memory are compared by a predefined word synchronization pattern compare function with said predefined word synchronization pattern; said predefined word synchronization pattern including multiple pattern match sequences.

16. (currently amended) Apparatus for word synchronization with large coding distance and fault tolerance as recited in claim ~~16~~ 15 wherein said predefined word synchronization pattern compare function identifies at least a predefined subset of said multiple pattern match sequences and generates a start of data trigger for the partial-response maximum-likelihood (PRML) data channel.

17. (canceled)

18. (currently amended) A method for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel ~~as recited in claim 17 wherein the step of~~ in a direct access storage device (DASD) comprising the steps of:

sensing a readback signal including ~~said~~ a predefined word synchronization pattern ~~includes~~ including the step of generating said predefined word synchronization

pattern including only even length magnets; said predefined word synchronization

pattern including multiple pattern match sequences;

providing a dedicated Viterbi detector optimized for said predefined word
synchronization pattern and said Viterbi detector including a two-state Viterbi trellis and
a word synchronization detector for said two-state Viterbi trellis;

applying equalized PR4 samples from said readback signal including said
predefined word synchronization pattern to said dedicated Viterbi detector;

detecting a predefined number of said multiple pattern match sequences of said
predefined word synchronization pattern with said Viterbi detector; and

generating a start of data trigger for the partial-response maximum-likelihood
(PRML) data channel.

19. (currently amended) A method for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel as recited in claim 47 ~~18~~ wherein the step of providing a dedicated Viterbi detector optimized for said predefined word synchronization pattern includes the step of optimizing said Viterbi detector by eliminating branches from said two-state Viterbi trellis, thereby increasing coding distance.

20. (currently amended) A method for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel as recited in claim 47 ~~18~~ wherein said predefined word synchronization pattern includes three pattern match sequences and where the step of detecting said predefined number of said multiple pattern match sequences of said predefined word

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synchronization pattern with said Viterbi detector includes the step of detecting two of said three pattern match sequences of said predefined word synchronization pattern.